Asbestos manufacture is a new industry in the Philippines. At present only one district—that of Ilocos Norte—is productive. Both amphibole and chrysotile asbestos are known. An asbestos plant is now operating in Manila.

Oil exploration is so far merely preliminary and confined to the Lake Lanao-Cotabato district (Mindanao) and to the Tayabas field. The Mindanao oils have a specific gravity of .93 to .91 as analyzed; the base is paraffin.

Sulphur is found in solfataras and in the impure state, mixed with volcanic ash, in several localities. The production of cement has virtually ceased because of the failure of the largest cement plant. Fire-clay, lime, sand and gravel, stone, salt, and mineral and artesian waters are the other resources treated. A separate chapter is devoted to glass-making; this demonstrates the accessibility of all the material necessary to the process—lime, silica, and alkali.

The report urges the revision of the federal mining laws and the establishment of a school of mines. The adoption of a leasehold system is advocated; present mining law in the Philippines requires that 200 pesos worth of development be performed annually on located, unpatented claims, which "does not always accomplish the purpose sought either by the Government or the claim holder."

The report contains a directory of mine-owners, lessees, and operators, and a transcript of the mining laws of the Philippine Islands. Several good photographs accompany the report, but unfortunately others are carelessly mounted—possibly the error of the publisher—and still others show little or nothing of the very features they are presumed to illustrate. Some of these shortcomings may no doubt be laid at the door of the smallness of the funds available, which has compelled a reduced staff to disperse its energies over a large field. Similarly, no doubt, the general lack of detailed geological descriptions may be accounted for. All in all, the report is of distinct value.

C. H. B., JR.

Deposits of Manganese Ore in Costa Rica and Panama. By JULIAN D. SEARS. Bulletin 710-C, United States Geological Survey, Government Printing Office, Washington, D.C., 1919. Pp. 31, pls. 1, figs. 28.

This bulletin is actually two separate papers—one dealing with the manganese of Costa Rica, the other with that of Panama.

The known manganese deposits of Costa Rica are all in the Province of Guanacaste, on the Pacific Coast. They are widespread, but generally

either of low grade or of small extent. Only two really important deposits are worked.

The important manganese deposits of Costa Rica are in the Nicoya Peninsula, which is very hilly, with a "backbone" running in a generally northwesterly direction. The east coast (Nicoya Gulf) is low, with swamps and estuaries, while the Pacific coast is high and rugged. The rocks are chiefly sandstone, shale, conglomerate, and limestone. Most of the sediments have undergone considerable dynamo-metamorphism, the greater part being now iron-pigmented quartzite, but other less highly colored quartzite occurs higher in the sequence. Silicified limestone, shale, and breccia are also reported. Igneous rocks include basic fine-grained types, largely flows (?). Some intrusions are also thought to characterize the region though no plutonic rocks are actually described. Structurally the area seems to indicate an igneous basement, with superjacent sediments that have been intricately folded and faulted since deposition.

The ore-bodies are manganese oxides, partly soft (pyrolusite?), partly hard and crystalline. Iron oxide is generally low, but silica occurs mechanically admixed. The oxides are found in pockets or troughs between the red metamorphosed rocks and lighter colored sediments, or may be in direct contact with igneous rock. Generally the deposits are too small to merit another term than "pocket," but they may be as large as 500 by 100 feet, averaging 5 feet in thickness. The exact size of these ore-bodies is not determinable, and estimates of a reserve based on a 40–45 per cent ore are therefore not dependable.

The ores are related to fault zones but not all the faults of the region are ore-bearing. The ore is attributed by the writer to hydrothermal action, the hot, ascending solutions passing along the faults and spreading on planes of contact between formations and depositing the manganese as a carbonate or silicate which was later oxidized. The great silicification of the wall rock and close relation between the ore and fissures are supposed to lend credence to this view. On the other hand the manganese may be the product of downward concentration, deposited because of the impermeability of the highly metamorphosed rocks.

A detailed discussion of the mines and prospects emphasizes their economic insignificance. Two only are of importance as producers at present, those at Playa Real and at Curiol, and one prospect (Pavones) may prove to be productive in the future.

In Panama two manganese deposits are known on the west side of the Boqueron River, about 20 miles east of Colon. The country near

the mines is hilly, and in places reaches altitudes of 1,000 feet. The rock immediately adjacent to the deposits is fine-grained sediment containing much siliceous cement, or hard, gray, siliceous limestone. Associated with the ore-bodies are shales and breccias, and a dark igneous rock, probably basalt.

At Mine No. 1, the manganese occurs as mixed oxides, largely in bowlders, or segregated in lenses and sheets in varicolored clays. The manganese ore may be in stringers or beds in the clay. It appears to be the result of concentration and segregation. Taking all the possible sources of manganese together, about 10,000 tons are available at this locality.

At Mine No. 2 the ore is also in bowlders, which lie on the surface, or in clay banks; here too are sheets of manganese ore, ranging in thickness to 15 feet. Manganese is also segregated in a zone in bedded breccia, formed apparently through concentration in the residual clays that weathered from the breccia.

In general, therefore, the manganese ores appear to be residual, not unlike those of the Piedmont district of southeastern United States.

C. H. B., Jr.

The Iron and Associated Industries of Lorraine, the Sarre District, Luxemburg, and Belgium. By Alfred H. Brooks and Morris F. LaCroix. United States Geological Survey, Bulletin 703, 1920. Government Printing Office, Washington, D.C. Pp. 131, pls. 2, figs. 12, and numerous tables, including statistics on Belgian iron and coal production.

This report was prepared at Paris for the use of the American Commission to Negotiate Peace. It illustrates again the value of geology in fields normally considered foreign to the science. It calls to mind too the desirability of making peace-terms on the basis of such carefully organized facts with a view to stabilizing world-industry, rather than on the principle that to the victor belong the spoils.

The purpose of the original report was to lay before the commission certain facts relating to the pre-war use of Lorraine iron ore and thereby to forecast the probable future of the metallurgical industry in Lorraine as modified by the new national control which were under discussion when the report was submitted. . . . . The original report was in effect an argument for the adoption of certain policies with reference to the iron and coal industries of central Europe. . . . . For these reasons the reader will find that certain parts of the report are presented as arguments rather than as expositions.